

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

MICROSOFT CORPORATION,
Plaintiff,

v.

ALCATEL-LUCENT ENTERPRISE
and
GENESYS TELECOMMUNICATIONS
LABORATORIES, INC.,
Defendants.

C.A. No. 07-090-SLR

PUBLIC VERSION

**DECLARATION OF WILLIAM H. BECKMANN, PH.D., IN SUPPORT OF
MICROSOFT'S OPPOSITION TO DEFENDANTS' MOTION FOR
SUMMARY JUDGMENT OF NONINFRINGEMENT AND INVALIDITY
FOR ALL ASSERTED CLAIMS OF U.S. PATENT NO. 6,430,289**

I, William H. Beckmann, Ph.D., declare:

1. I, William H. Beckmann, Ph.D., have been retained by counsel for Microsoft Corporation ("Microsoft") to analyze and investigate certain issues relating to U.S. Patent Nos. 6,234,064, 6,278,357, 6,421,439, and 6,430,289 ("the '289 patent") asserted by Microsoft against Defendants Alcatel-Lucent Enterprise ("ALE") and Genesys Telecommunications, Inc. ("Genesys"). I have personal knowledge of the matters stated in this declaration and would testify truthfully to them if called upon to do so.

2. I have nearly thirty years of experience in the telecommunications field, including unified communication systems and computer telephony. Between 1995 and 1999, for example, I served as a Vice President at IBM Corporation responsible for broadband digital solutions and digital video systems and headed the team responsible for IBM's corporate strategy for digital broadband. Between 1984 and 1989, I served as a manager at Bell Communications Research responsible for integrating ISDN and Advanced Intelligent Networks and for the design of

multimedia network systems. Between 1980 and 1984, I served as a manager and lead systems engineer at Bell Laboratories, where I created and managed a group responsible for systems integration of packet-switched data networks with voice networks and also designed and developed fast packet switching systems for voice and data traffic. During that time, I also served as an adjunct professor of Telecommunications Engineering at Rensselaer Polytechnic Institute. I received a bachelor's degree in Mathematics from Davidson College in 1972, a master's degree in mathematics from Cornell University in 1974, and a Ph.D. in mathematics from Cornell University in 1980. Additional information regarding my technical background is included in my resume, which is attached hereto as Exhibit 1.

3. I understand that the first step in determining whether a patent claim is infringed is determining how the terms of the asserted claims should be construed. While the Court has not yet construed the terms at issue here, I understand that the parties have an ongoing dialogue on claim construction, have exchanged initial proposed constructions, and have provided opening briefs on claim construction to the Court.

4. I further understand that the claims are to be interpreted from the perspective of a person of ordinary skill in the time of the invention. In that regard, I understand that I may provide relevant background information to assist the Court in understanding the technology at issue and in construing the asserted claims from the perspective of a person of ordinary skill in the relevant art.

5. In assessing infringement, I understand that literal infringement of a patent claim requires that each limitation of the claim is present in the accused product. I also understand that indirect infringement of a patent claim requires that the indirect infringer have contributed to or induced another to directly infringe a patent claim.

6. It is my understanding that a patent claim is presumed valid. I understand that a patent claim can be rendered invalid only by clear and convincing evidence.

7. It is my understanding that a patent claim is invalid as anticipated when a single prior art reference discloses each and every limitation of that claim, as properly construed. In addition, I understand that the prior art reference must enable one of ordinary skill in the art to practice the claim without undue experimentation.

8. I have reviewed the '289 patent and each of the accused systems.

9. I have also reviewed Defendants' Motion for Summary Judgment of Noninfringement and Invalidity for all Asserted Claims of U.S. Patent No. 6,430,289, D.I. 154; the Declaration of Henry Hyde-Thomson in Support of Defendants' Motions for Summary Judgment of Noninfringement and Invalidity for all Asserted Claims of U.S. Patent Nos. 6,623,064, 6,728,357, 6,640,289, and 6,421,439, D.I. 161; and the Declaration of Dr. Leonard J. Forys, Ph.D., in Support of Defendants' Motion for Summary Judgment of Noninfringement of U.S. Patent No. 6,430,289, D.I. 156.

10. I have also reviewed each of the documents cited or discussed in this declaration, as well as each of the documents attached to the Declaration of Raymond Scott, June 20, 2008.

11. Further, I incorporate herein by reference my expert reports of March 28, 2008, and April 18, 2008, including the exhibits attached thereto. True and correct copies of these reports are attached as exhibits to the Declaration of Raymond Scott. [See Scott Exs. 30–31.]¹ Incorporated herein by reference, and attached hereto as Exhibit 2 for ease of reference, is the chart detailing my opinions regarding infringement of the '289 patent by the OXE system. Incorporated herein by reference, and attached hereto as Exhibit 3 for ease of reference, is the

¹ All exhibits referenced as "Scott Ex. ____" are exhibits to the accompanying Declaration of

chart detailing my opinions regarding infringement of the '289 patent by the OXO system. And incorporated herein by reference, and attached hereto as Exhibit 4 for ease of reference, is the chart detailing my opinions regarding infringement of the '289 patent by the Genesys system.

12. It is my opinion that the accused OmniPCX Enterprise system ("the OXE system") infringes claims 1, 7, 8, and 10 of the '289 patent.



14. A softphone-



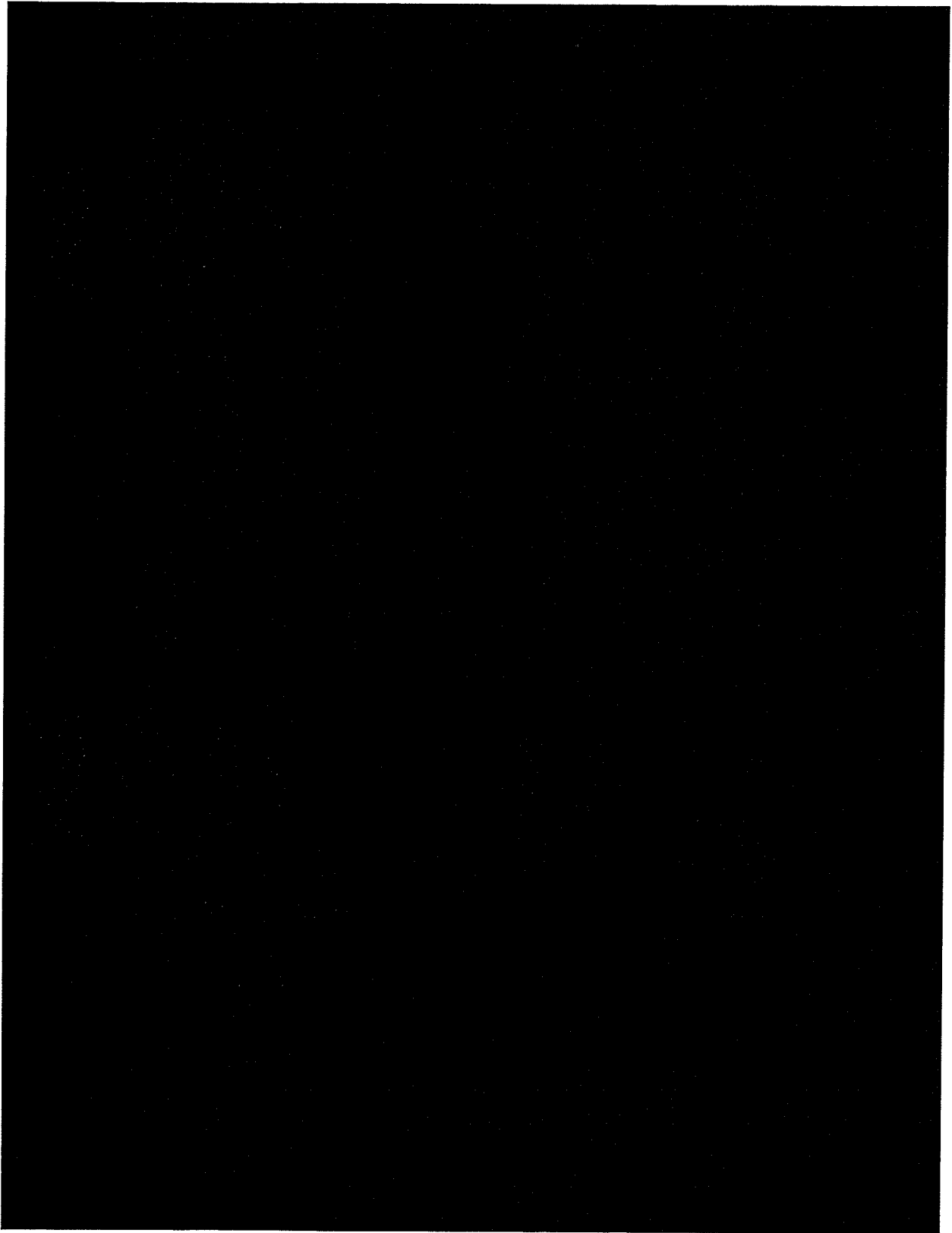
is a computer application that allows a user to make telephone calls using his personal computer, rather than a conventional telephone handset.

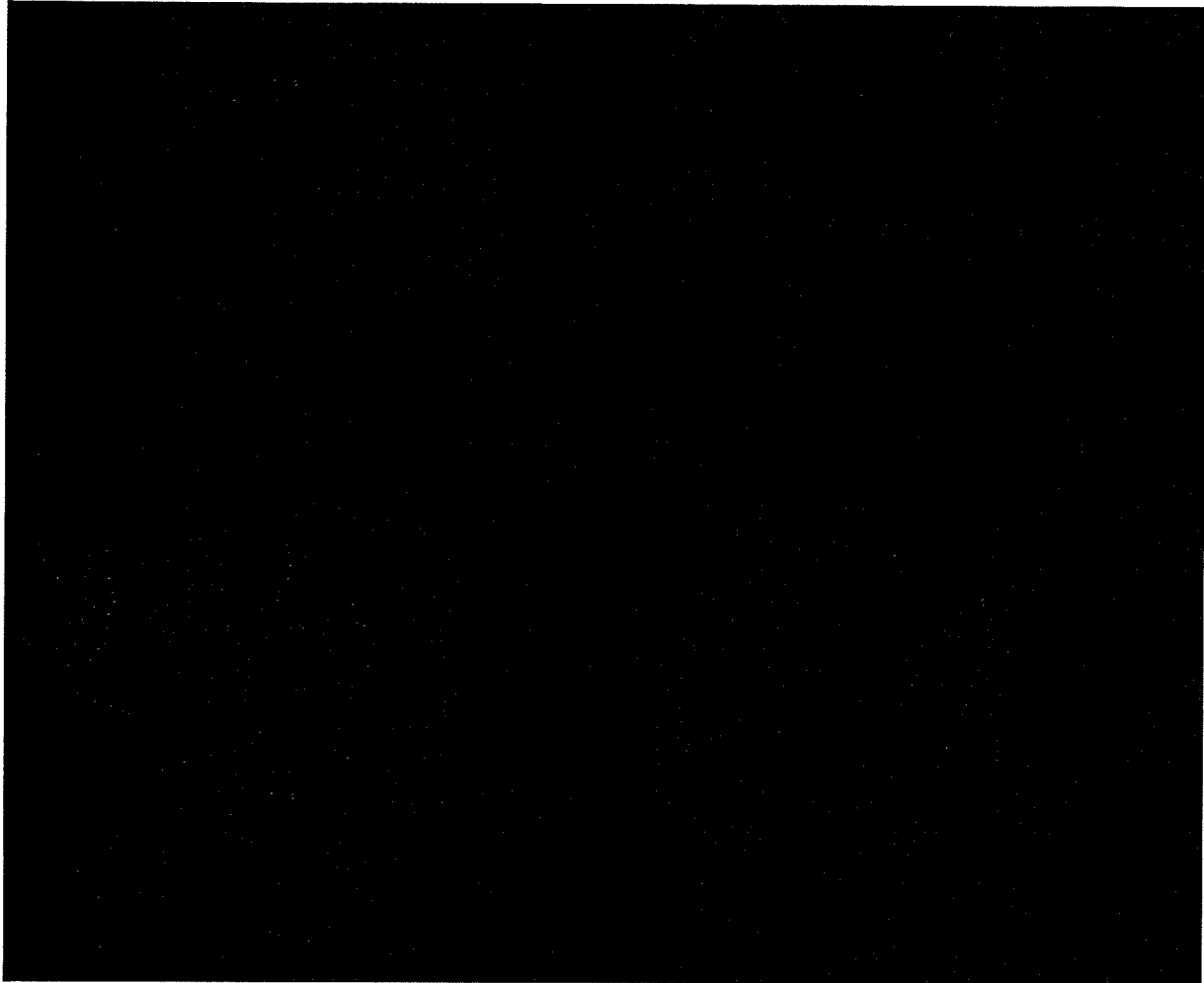


Softphone applications, like other computer applications, utilize computer resources to process computer input—e.g., the user's voice, spoken into a computer microphone; mouse movements or keyboard input to dial a telephone number—into digital data.

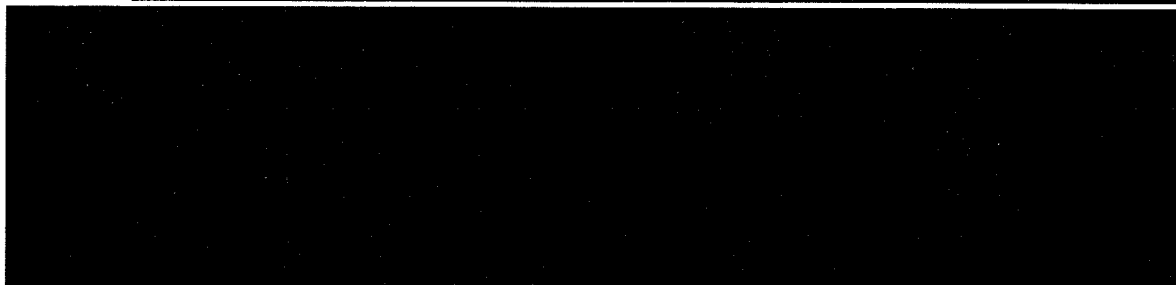


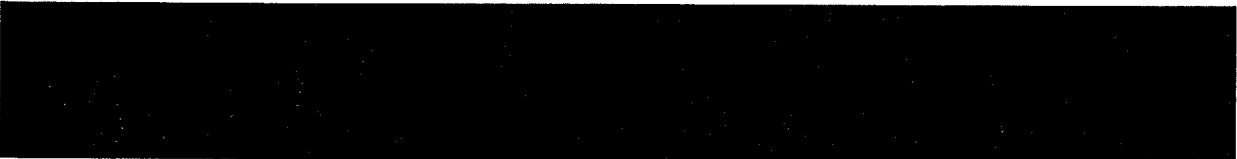
Raymond Scott, dated June 20, 2008, submitted herewith.






18. The OXE system meets the limitation “monitoring activity of a user computer” under either party’s construction of that term. I understand that Microsoft has proposed that this term does not require any explicit construction; if a construction is required, Microsoft proposes “monitoring the status of a user computer.” The OXE system meets the limitations of either proposal. [REDACTED]







19. I further understand that ALE has proposed that this term be construed to mean “determining whether the called party’s computer is idle or active.” The OXE system meets this limitation.




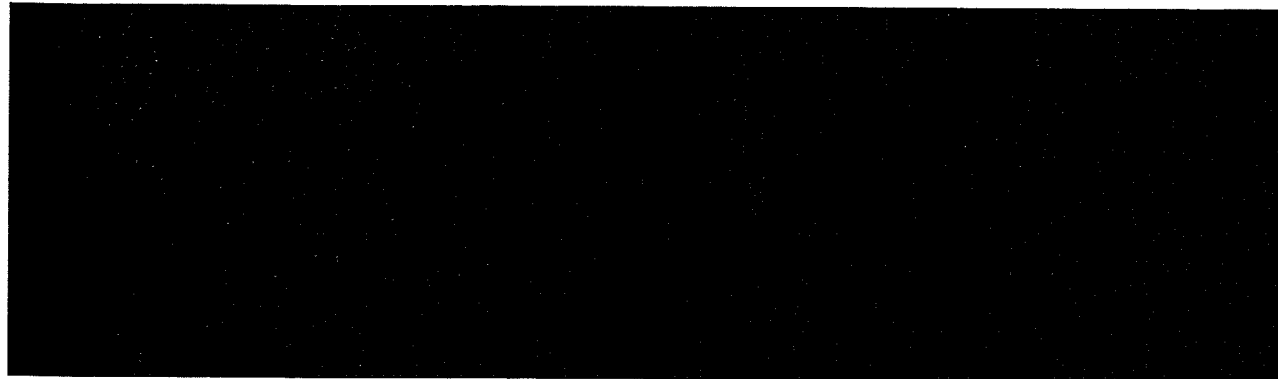
20. The OXE system meets the limitation “at the computer network, receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party” under Microsoft’s construction of that term. I understand that Microsoft has proposed that this term does not require any explicit construction; if an explicit construction is required, Microsoft proposes “receiving at the computer network information from the telephone network that a telephone call from a first party to a second party has been initiated.” The OXE system meets the limitations of either proposal.



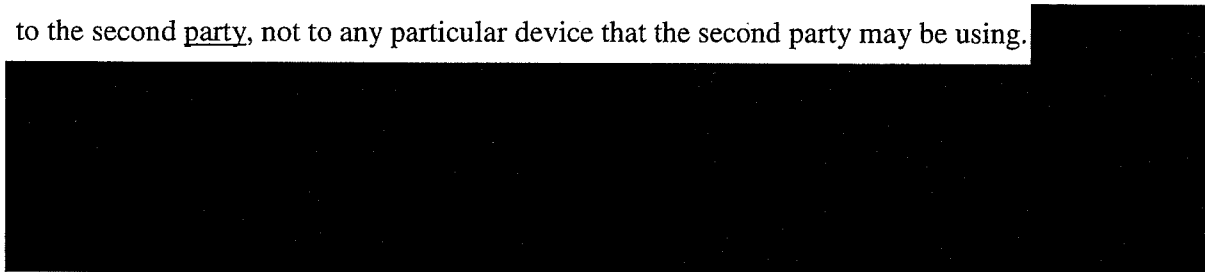


21. The OXE system meets the limitation “at the computer network, using the set of a pre-determined rules to process i) the information received from the telephone network regarding the call being originated by the first party, and ii) information regarding the monitored activity of the user computer of the second party, to determine when the second party is available to take the call originated by the first party.” I understand that neither party has proposed explicit constructions for this term.



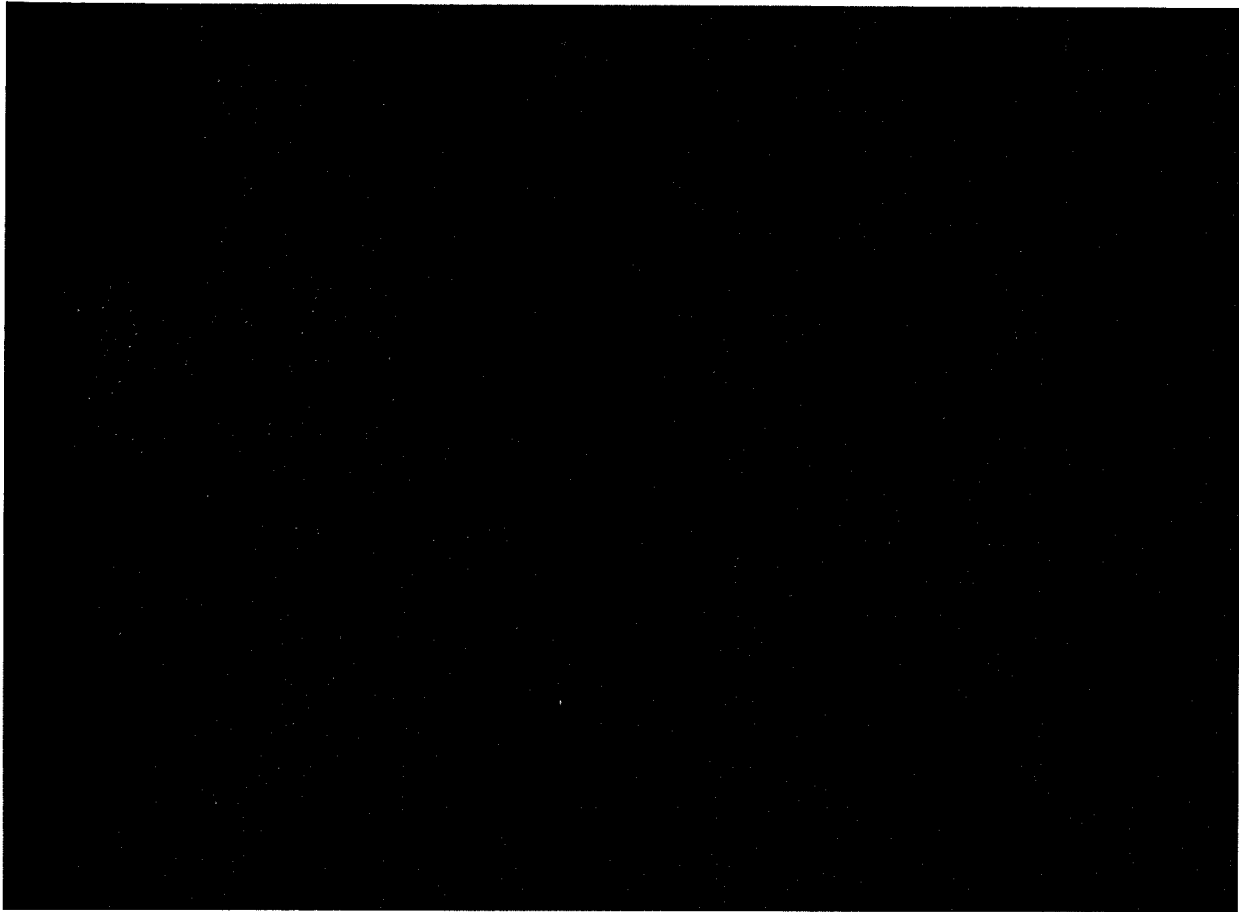


22. The OXE system meets the limitation “using the information processed at the computer network to facilitate connecting the call originated by the first party through the telephone network to the second party.” It is my understanding that ALE contests this limitation on grounds that a scenario where a user is busy on his softphone never results in connecting the call to the second party because the second party is always busy. In my opinion, ALE’s proposal is out of line with how a person of ordinary skill in the art would understand the claims. When a user is busy on his softphone, and incoming calls routed to voicemail or to another user, the system is still “facilitating” a connection. Further, the claims identify that the call is connected to the second party, not to any particular device that the second party may be using.



23. It is my opinion that the accused Alcatel OmniPCX Office system (“the OXO system”) directly infringes claims 1, 7, 8, and 10 of the ’289 patent, either literally or under the doctrine of equivalents.

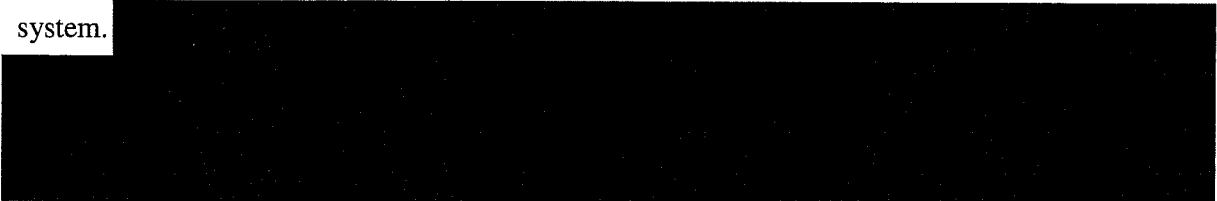





27. The OXO system meets the limitation “at the computer network, monitoring activity of a user computer,” under either party’s construction of the term, for the same reasons discussed supra with regard to the OXE system.

28. The OXO system meets the limitation “at the computer network, receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party,” under Microsoft’s construction of the term, for the same reasons discussed supra with regard to the OXE system.

29. The OXO system meets the limitation “at the computer network, using the set of a pre-determined rules to process i) the information received from the telephone network regarding the call being originated by the first party, and ii) information regarding the monitored activity of the user computer of the second party, to determine when the second party is available to take the call originated by the first party,” for the same reasons discussed supra with regard to the OXE system.




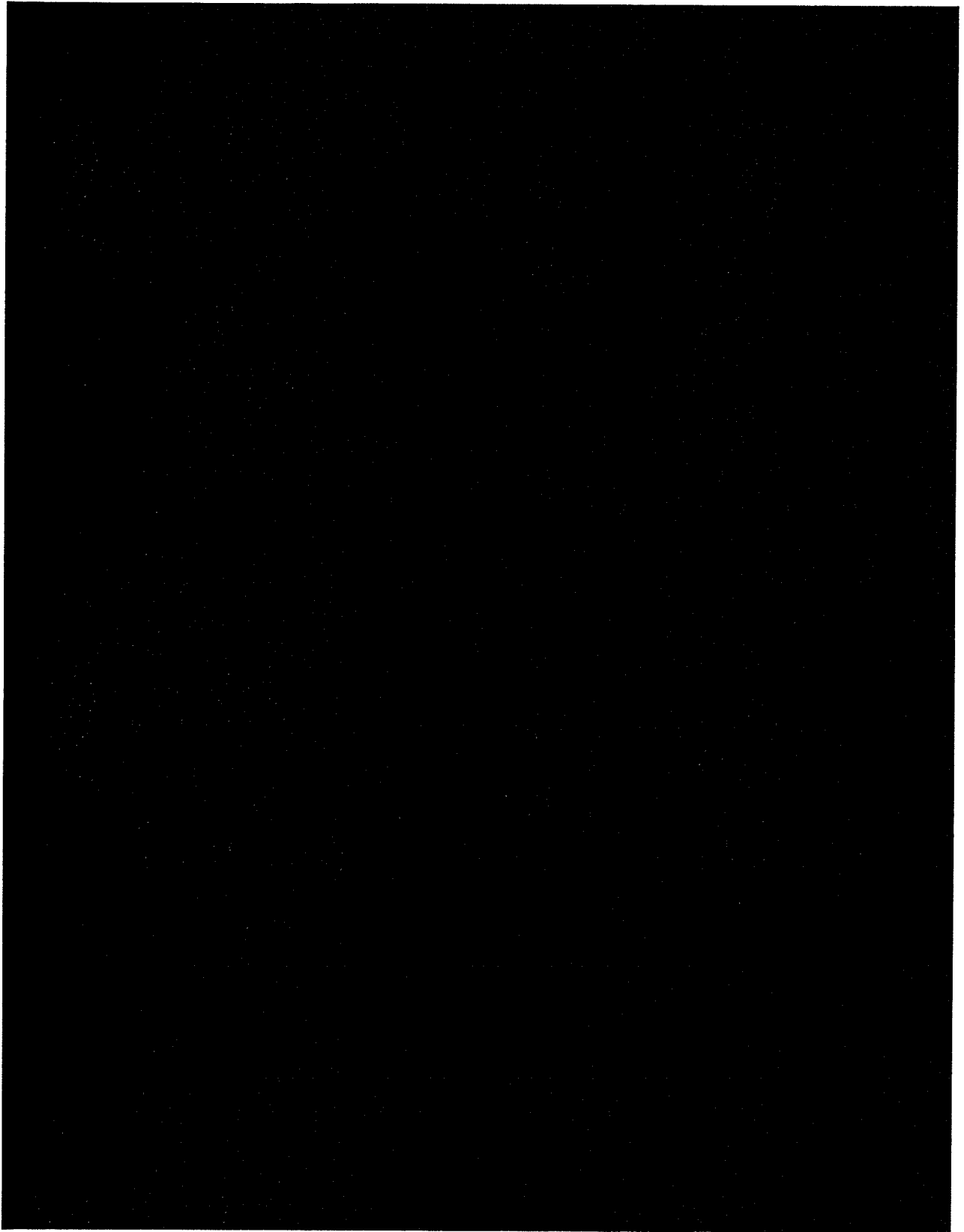
30. The OXO system meets the limitation “using the information processed at the computer network to facilitate connecting the call originated by the first party through the telephone network to the second party,” for the same reasons discussed supra with regard to the OXE system.

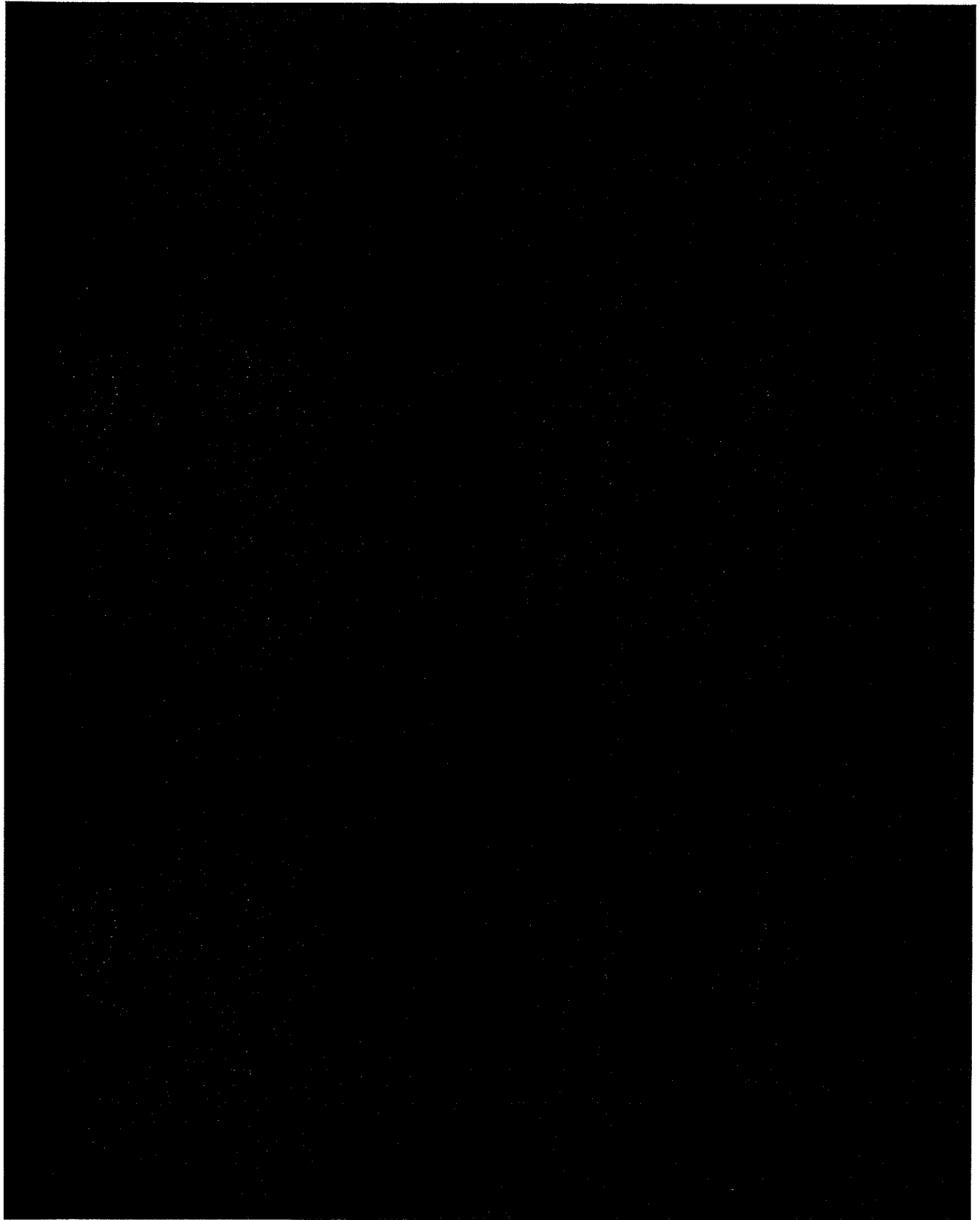


31. Both the OXE and OXO systems practice all limitations of all asserted claims of the '289 patent. I discuss each limitation more fully in my first expert report of March 28, 2008, which I have incorporated by reference.

32. It is my opinion that the Accused Genesys System directly infringes claims 1, 3, 7, 8, and 10 of the '289 patent.







[REDACTED]

36. The Genesys system meets the limitation “monitoring activity of a user computer” under either party’s construction of that term. [REDACTED]

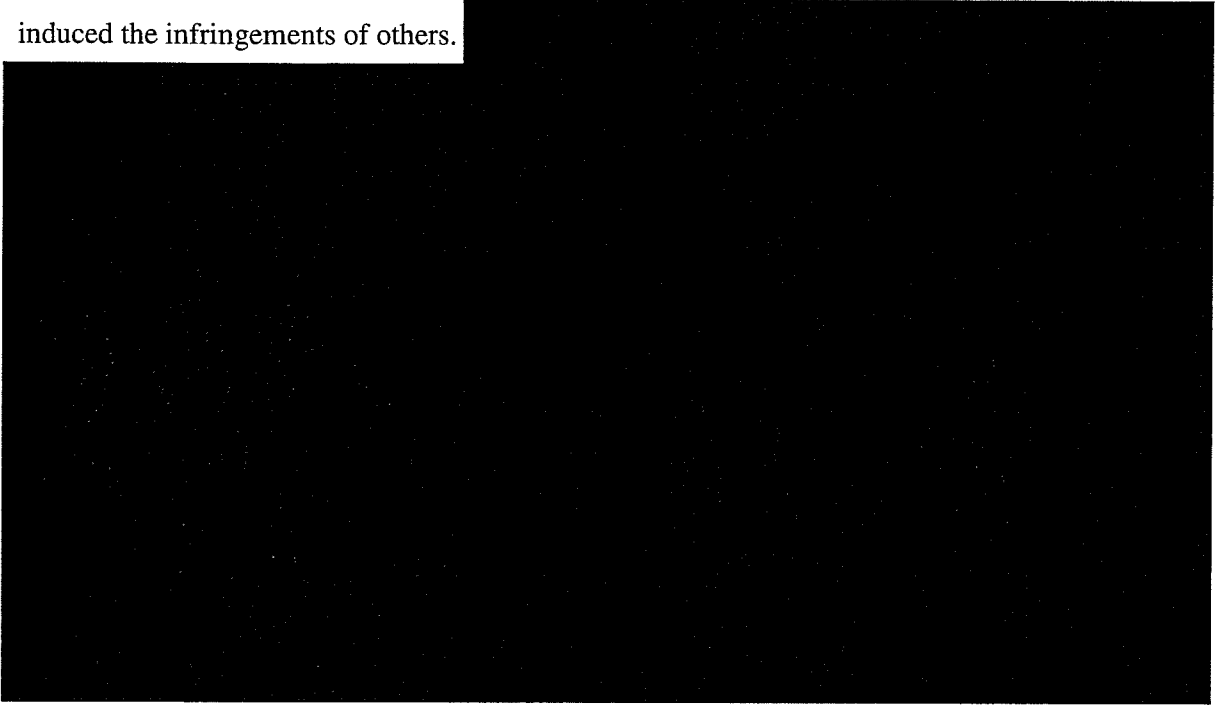
[REDACTED]

37. The Genesys system meets the limitation “at the computer network, receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communication with a second party.” [REDACTED]

[REDACTED]

38. The Genesys system practices all limitations of all asserted claims of the ’289 patent. I discuss each limitation more fully in my first expert report of March 28, 2008, which I have incorporated by reference.

39. In addition to directly infringing the '289 patent, Genesys has contributed to and induced the infringements of others.



40. I have also reviewed U.S. Patent No. 6,041,114 to Chestnut (filed Mar. 27, 1997) ("Chestnut"). [Scott Ex. 36.] In my opinion, Chestnut does not anticipate any of the asserted claims of the '289 patent.

41. Chestnut fails to disclose the limitation "at the computer network, receiving information from the telephone network that a first party from whom a call is originating desires to establish telephone communications with a second party." In his declaration, Mr. Hyde-Thomson asserted that the "telecommute server receives the call when the telecommute server 'intercepts' the call." [Hyde-Thomson Decl. ¶ 98.] However, Mr. Hyde-Thomson did not establish that Chestnut discloses receiving information "at the computer network." In addressing the '439 patent, Mr. Hyde-Thomson pointed to the same cited disclosure in asserting that the telecommute server is a controller and thus, on the telephone network. [Hyde-Thomson Decl. ¶ 98.]

42. Chestnut fails to disclose the limitation “at the computer network, monitoring activity of a user computer connected to the computer network.” In his declaration, Mr. Hyde-Thomson stated that the telecommute server checks the computer network to see if the called party is logged on and instructs the PBX to forward the call. However, Mr. Hyde-Thomson does not establish that Chestnut discloses any monitoring “at the computer network.” In addressing the ’439 patent, Mr. Hyde-Thomson takes an inconsistent position in asserting that the telecommute server is a controller and thus, on the telephone network. [Hyde-Thomson Decl. ¶ 98.] Chestnut also does not disclose monitoring activity of the user computer. The act of logging on to a computer is not activity of a user computer connected to the computer network as Mr. Hyde-Thomson noted in his own report, but is instead a precursor to activity of a user computer connected to the computer network. A user computer is not connected to the computer network until after the act of logging on. The fact that the user is logged on to the computer network also does not give any indication regarding the activity or status of the user computer.

43. Chestnut fails to disclose the limitation “at the computer network, storing a set of predetermined rules for determining when the second party is available to take a call from the first party.” First, Mr. Hyde-Thomson does not establish storing a set of predetermined rules “at the computer network.” In addressing the ’439 patent, Mr. Hyde-Thomson asserts that part of the telecommute server is on the telephone network and part of the telecommute server is on the computer network. [Hyde-Thomson Decl. ¶ 98.] Mr. Hyde-Thomson, however, does not point to any disclosure that this limitation is performed at the “computer network portion of the telecommute server.” Mr. Hyde-Thomson also does not establish that Chestnut discloses predetermined rules for determining when the second party is available to take a call. Chestnut

discloses call forwarding based on the location of the device used to log onto the computer network. Chestnut does not disclose rules for determining when the callee is available to take a call.

44. Chestnut fails to disclose the limitation “at the computer network, using the set of predetermined rules to process i) the information received from the telephone network regarding the call being originated by the first party, and ii) information regarding the monitored activity of the user computer of the second party, to determine when the second party is available to take the call originated by the first party.” For the reasons discussed above, Chestnut does not disclose this limitation. Moreover, Mr. Hyde-Thomson does not establish that Chestnut discloses using the set of predetermined rules to process any information at the computer network. In addressing the ’439 patent, Mr. Hyde-Thomson is taking the position that part of the telecommute server is on the telephone network and part of the telecommute server is on the computer network. [Hyde-Thomson Decl. ¶ 98.] Mr. Hyde-Thomson, however, does not point to any disclosure that this limitation is performed at the “computer network portion of the telecommute server.”


45. For these reasons, it is my opinion that Chestnut does not anticipate claim 1 of the ’289 patent.

46. In addition, Chestnut does not disclose a “computer program product” for processing an incoming call as taught in claim 7. Mr. Hyde-Thomson opines that Chestnut discloses this computer program product because the patent refers generally to “the idea of a computer program product.” [Hyde-Thomson Decl. ¶ 89.] However, Mr. Hyde-Thomson points to no specific computer program product, or computer readable medium, that processes the call as taught in claim 7. For this reason, too, it is my opinion that Chestnut does not anticipate claim 7 of the ’289 patent.

47. In my second expert report of April 18, 2008, which I have incorporated by reference, I offer some additional discussion of why Chestnut does not anticipate the asserted claims of the '289 patent.

I declare under the penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed this 20th day of June 2008 in Cross River, New York.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "William A. Beckmann", with a long, sweeping horizontal line extending to the right.

William H. Beckmann, Ph.D.

CERTIFICATE OF SERVICE

I hereby certify that on June 27, 2008, I electronically filed with the Clerk of Court the attached **PUBLIC VERSION – DECLARATION OF WILLIAM H. BECKMANN, PH.D., IN SUPPORT OF MICROSOFT’S OPPOSITION TO DEFENDANTS’ MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT AND INVALIDITY FOR ALL ASSERTED CLAIMS OF UNITED STATES PATENT NO. 6,430,289**, using CM/ECF which will send notification of such filing to the following individuals:

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Los Angeles, CA 90071

/s/ Thomas L. Halkowski
Thomas L. Halkowski
halkowski@fr.com

EXHIBIT 1

William H. Beckmann, Ph.D.
Curriculum Vitae

Professional Summary

Dr. Beckmann has almost thirty years of academic and industry experience focused in the fields of communications networks and information technology. He has been responsible for managing and solving business and technical issues in these fields. Dr. Beckmann is an expert in all aspects of broadband network and software technologies and their implementation into advanced communications networks. He has had experience in strategic planning, marketing, business development, technical development, deployment, and management of these technologies and networks.

Expertise

- Advanced Intelligent Networks
- Broadband Communications
- Digital Networking Technologies
- Digital Video Systems
- Distributed Processing Systems
- Network Architecture
- Network Management & Operations
- Software Design & Architecture

Education

<u>Year</u>	<u>College or University</u>	<u>Degree</u>
1980	Cornell University	Ph.D., Mathematics
1974	Cornell University	M.S., Mathematics
1972	Davidson College	B.S., Summa cum Laude, Mathematics

Professional Experience

From: 1999
 To: Present
 Organization: Networking Computing Associates
 Title: President and Co-Founder
 Summary: Network Computing Associates (NCA) is a consulting firm that provides expertise to companies and organizations in making or executing decisions that involve network and information technologies and their integration into the company's business processes. NCA Clientele includes:

William H. Beckmann, Ph.D.
Curriculum Vitae

- Big Think, New York, NY
- Burst.com, San Francisco, CA
- Federal Communications Commission, Washington, DC
- General Electric, Fairfield, CT
- IBM, Somers, NY
- Lucent Technologies, Inc., Murray Hill, NJ
- Sorceron, New York NY
- Zoologic, New York, NY

From: 1995

To: 1999

Organization: IBM Corporation

Title: Vice President

Summary: Dr. Beckmann was responsible for broadband digital solutions and marketing, sales, deployment and development of digital video systems. In 1997, he headed the team that constructed the IBM corporate strategy for digital broadband. Accomplishments include:

- Took a digital video development level project into a global sales & distribution project known as Video Enabled Solutions (VES), with sales teams and support groups throughout the world. VES tied together teams in IBM Global Services, IBM's Systems Integration Division with the IBM Telecommunications & Media sales division. This project included development and sales of the IBM Media Streamer, a Unix-based server that could concurrently stream hundreds of digital broadband channels over cable or DSL transmission systems; and implementation and deployment of this server into a full digital network infrastructure, including operational and management support systems and integration of those systems with other similar systems that the customer may have already installed. Total new revenues for IBM from 1996 to 1998 exceeded \$120M.
- The Digital Broadband Strategy, presented to IBM's Chief Technology Council in 1997, addressed how every one of IBM's product, sales, and development groups should approach and assess arising broadband opportunities, and what those opportunities were likely to be. The strategy proposed what alliances IBM should seek and what new lines of business IBM should consider pursuing. The strategy covered all of IBM's technologies, from microelectronics through servers, software, and database and storage systems.

William H. Beckmann, Ph.D.
Curriculum Vitae

From: 1989
To: 1995
Organization: Ameritech
Title: Manager and Director in Corporate Strategy
Summary: Dr. Beckmann had responsibilities in development and deployment of advanced information technologies and multimedia systems. He was the lead in corporate strategy for the merger of five information, accounting, and billing systems of Ameritech's Bell Operating Companies into a single networked system. This effort consolidated Ameritech's various databases, CSR systems, and billing system that were spread out over the five Bell Operating Companies that comprised Ameritech, into a single comprehensive, integrated system. This involved geographical consolidation as well as software & IT consolidation for systems that were mission-critical and 24/7.

To achieve this required:

- Creation of a hot standby system that fully duplicated the data in the existing system in real time.
- Implementation of a high-speed network architecture linking the dispersed systems: the geographical consolidation was initially virtual- enabled by this high-speed networking. This network also fed the standby system.
- Development of an intermediate layer of software that allowed the legacy system software to run as always and permitted insertion of a new interface software layer that made CSR and other agent system interactions consistent and uniform throughout the RBOC service area. This software layer was object-oriented and represented the largest OO software deployment in the country at that time (1989/1990).

As an enhancement to its voice and data transport services, Ameritech considered moving into application transport services that required higher bandwidth: these applications were multimedia in nature. In particular, Ameritech was interested in services that could successfully compete with cable services. This required identification of potential sources of these services: broadcast services, such as those carried by cable, were not legally permitted for the RBOCs. To identify and attract such sources as well as to specify the requirements for the digital content, from a source perspective as well as from a consumer perspective, necessitated execution of the following technical program:

- Analysis of network transmission capabilities applied to actual subscriber loop data (1991 - 1992)
- Mapping of MPEG requirements to ADSL-based and SONET-based benchmarks (1990 - 1992)
- Design of network management systems for support and management of

William H. Beckmann, Ph.D.
Curriculum Vitae

broadband services

- Trial and Comparison of Fiber-to-the-Home and ADSL delivery of Video-on-Demand and Interactive Video Applications (Geneva Lakes WI, 1992)

From: 1984
To: 1989
Organization: Bell Communications Research (Bellcore)
Title: Manager
Summary: Dr. Beckmann was responsible for integration architectures of ISDN and Advanced Intelligent Networks (AIN) and for design of multimedia network systems (including broadband networks). This work encompassed technology, service, and business issues. Special areas of focus included: (1) remote management, operations, and programming of network nodes (switches, digital cross-connect systems, and data base management systems), software languages and interfaces for such remote systems, and uniform operational and management interfaces to multi-vendor environments; and (2) assessment and, where appropriate, migration of AIN design templates to ISDN and BISDN configurations.

Dr. Beckmann also served as the Bellcore graduate school recruiter in electrical engineering and computer science at the University of Southern California (Los Angeles).

From: 1980
To: 1984
Organization: Bell Laboratories
Title: Manager (1983-1984) and Member of Technical Staff (1980-1983)
Summary: During his time at Bell Labs, Dr. Beckmann was responsible for:

- Queuing theoretical analysis and algorithmic development for automatic call distribution systems
- System design and development (as the lead systems engineer) of a Fast Packet Switching system that digitized and packetized voice and multiplexed and switched voice and data traffic (predecessor of ATM technology)
- Creation and management of a group responsible for systems integration of packet-switched data networks with voice networks

William H. Beckmann, Ph.D.
Curriculum Vitae

From: 1982
To: 1982
Organization: Rensselaer Polytechnic Institute
Title: Adjunct Professor of Telecommunications Engineering

From: 1979
To: 1980
Organization: Middlebury College
Title: Assistant Professor of Mathematics and Computer Science and Mellon Fellow

From: 1977
To: 1979
Organization: Middlebury College
Title: Assistant Professor and Mellon Fellow

From: 1978
To: 1978
Organization: Harvard Medical School
Title: Adjunct Professor of Mathematics in the Medical Sciences

From: 1976
To: 1977
Organization: Cornell University
Title: Instructor in Mathematics

From: 1972
To: 1976
Organization: Cornell University
Title: National Science Foundation Graduate Fellow

Consulting Experience

From: 2006
To: 2006

William H. Beckmann, Ph.D.
Curriculum Vitae

Organization: Steptoe & Johnson
Summary: Provided technical consulting in Vonage v. Verizon

From: 1999
To: 1999
Organization: Federal Communications Commission
Summary: Technology and Business consulting on Broadband and Wireless systems

From: 1995
To: 1996
Organization: British Telecom
Summary: Business and technical consulting on engineering and deployment of ADSL and fiber systems, including switching and transmission facilities and information technology, and the underlying network management infrastructure

From: 1992
To: 1993
Organization: Ameritech Development Corporation
Summary: Provided technical and business due diligence analysis and report regarding ADSL and Amati Communications

Litigation Support Experience

Expert Engagement:

Type of Matter: Trade Secrets
Law Firm: McGrane Greenfield LLP
Case Name: Jasmine Networks, Inc. v. Sehat Sutardga, Marvell Semiconductor, Inc.
Services Provided: Expert Witness
Disposition: Ongoing
Date: 2007 -

Expert Engagement:

Type of Matter: Patent Infringement
Law Firm: Bingham McCutchen and Heller Ehrman LLP
Case Name: Inline Connection Corporation v. EarthLink, Inc.
Services Provided: Research; Expert Report; Testified at deposition and trial.

William H. Beckmann, Ph.D.
Curriculum Vitae

Disposition: Concluded
Date: 2005-2007

Expert Engagement:

Type of Matter: Patent Infringement
Law Firm: Heller Ehrman LLP
Case Name: Inline Connection Corporation v. CONTEL of the South Inc., GTE Southwest Inc., GTE.NET LLC, Telesector Resources Group, Inc., Verizon Internet Services, Inc. et al
Services Provided: Retained. Research. Case is on hold. Telecommunications\Networking Technology
Disposition: Continued pending outcome of Inline Connection Corporation v. EarthLink, Inc. above
Date: 2005-Present

Expert Engagement:

Type of Matter: Patent Infringement
Law Firm: Steptoe & Johnson
Case Name: USA Video Technology Corp. (US Video On Demand) v. MovieLink (partners: WB, Paramount, MGM, Universal Studios, Sony Pictures)
Services Provided: Research; Expert Report; Deposition
Disposition: Settled
Date: 2004 - 2005

Professional Affiliations

- Member, AMS (American Mathematical Society)
- Member, MAA (Mathematical Association of America)
- Member, AAAS (American Association for the Advancement of Science)
- Member, IEEE (Institute of Electrical and Electronics Engineers)
- Member, ACM (Association of Computing Machinery)

Patents & Publications

<u>Patent</u>	<u>Date Issued</u>	<u>Description</u>
6,675,388	2004	Data distribution system using coordinated analog and digital streams.

William H. Beckmann, Ph.D.
Curriculum Vitae

Presentations

Related to xDSL Technology

1. Panel Member, IEEE Conference on Digital Subscriber Line (DSL) Technologies, San Jose (1992)
2. "Asymmetric Switching Requirements in Digital Switching Systems Generated by ADSL Deployment," invited address at AT&T Conference on Advanced Switching System Technologies, Chicago (1991)
3. "Issues in Preparing for ADSL and HDSL Implementation," talk presented to Regional Bell Operating Company (RBOC) engineers, Chicago (September 1989)
4. "Impact of Digital Processing Requirements for ADSL Deployment in the Intelligent Network," talk presented to Bellcore (September 1988)

Related to General Broadband Technologies and Voice/Data Integration Technologies

1. "Comparison of High Definition Video Alternatives within IP Networks," Joint presentation with Dr. Michael Haley to IETF reviewing Internet-2 (1997)
2. "Management and Operations in a Network Supporting Voice, Data, and Video," Presentation to STET and Telecom Italia, Rome (1996)
3. "FDDI and ATM Network Comparisons and Interfaces," Invited Presentation to Digital Equipment Corporation, Boston (1990)
4. Keynote Address on Digital communications systems and applications at the IEEE International Conference on Digital Communications, Stuttgart (1988)
5. Presentation on "Digital Broadband Networks and Multimedia Applications" at International ISDN Conference in London (1987)
6. "Recommendation for Protocol Headers in Voice Packets," Presentation to Study Group XVIII, CCITT, Geneva (September 1983)
7. "Transport of Voice Streams in an X.25 Network," Presentation to JWG (Study Group VII/XI), CCITT, Washington (June 1983)

Articles and Memoranda

1. "Business and Technical Analysis of Proposed Ethernet Network and IEEE 802.6 Extensions through a WAN," consulting memo for Lucent Technologies (November 1999)
2. "Decisions, Decisions: Digital data broadcasting can provide new revenue streams for telcos, cable companies and DBS service providers," *Telephony* (October 1997)
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 11. "Synchronizing Packet Streams over a Multi-Routing Packet Network," Technical Memorandum, Bell Telephone Laboratories (1981)

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EXHIBIT 2

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IN ITS ENTIRETY

EXHIBIT 3

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EXHIBIT 4

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